

### **Abstract of the Disclosure**

Multi-channel audio signal processing systems and techniques are provided for electronic instruments having multiple and distinct output channels. Such systems may be used in conjunction with instruments comprising multiple vibrating elements, each with a dedicated signal output. Each received audio signal channel may be directed to a dedicated or shared signal processor for variably changing selected attributes of pitch, timing, timbre, and amplitude in ways that are unique for each signal. Signal processors may be shared using an allocating mixer, allocating switch, or both. An output mixer may be used to mix signal processor output signals into one or more outgoing mixed audio signals. Signal processors, mixers, and switches may be configured by stored program control and controlled in real-time. Real-time pitch variations can be used to change the pitch organization of fixed-pitch vibrating elements within an electronic musical instrument.